基于视频的运动目标检测研究与实现

摘　　要

基于三帧间差分法与背景差分法（Surendra 算法）的混合改进算法是用于检测运动目标的一种算法，这种算法能够在短时间内，不占用过多资源的情况下检测出运动目标，基本能够满足日常生活中对运动目标检测的要求，具有很高的实用性和研究价值。本论文是基于帧间差分法和背景差分法来进行研究的。将帧间差分法对光照变化不敏感和背景差分法对背景不敏感的优势结合起来，进而提高改进算法抗干扰能力。本课题主要从以下方面进行研究，首先介绍各种基本检测算法的研究现状和发展趋势，阐述本课题的研究价值。其次，介绍各种图像处理技术，为后面的检测打下基础。接着，介绍几种基本检测算法的原理，分析其优势和不足，为改进算法的建立提供理论依据，介绍了需要建立光流场的光流法，着重阐述了对图像帧进行差分运算的帧间差分法和以建立背景模型为重点的背景差分法。然后，提出改进算法，阐述其原理，对其性能进行理论分析。最后通过实验得出检测结果，并对检测结果进行讨论分析，论证实验结果与理论的关系。

关键词：运动目标;检测;帧间差分法;背景差分法;改进算法

Abstract

The hybrid improved algorithm based on the three frame difference method and the background difference method (Surendra algorithm) is a kind of algorithm used to detect the moving target. This algorithm can detect the moving target in a short time without taking up too much resources. It can basically meet the requirements of moving target detection in daily life, and has high practicability and research value. This paper is based on frame difference method and background difference method. Combining the advantages of the frame difference method and the background difference method, the anti-interference ability of the improved algorithm is improved. This topic mainly studies from the following aspects. Firstly, it introduces the research status and development trend of various basic detection algorithms, and expounds the research value of this topic. Secondly, it introduces all kinds of image processing technology to lay the foundation for the later detection. Then, it introduces the principle of several basic detection algorithms, analyzes their advantages and disadvantages, and provides a theoretical basis for the establishment of the improved algorithm. It focuses on the optical flow method that needs to establish the optical flow field, the frame to frame difference operation and the background difference method that focuses on the establishment of the background model. Then, the improved algorithm is proposed, its principle is explained, and its performance is analyzed theoretically. Finally, the test results are obtained through experiments, and the relationship between the test results and theory is demonstrated.

Keywords: moving target; detection;frame difference;background difference; improved algorithm

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